

ABSTRACT OF THE DISCLOSURE

A stimulation electrode is provided having an electrically conducting electrode base member which is partially covered with an electrically insulating ceramic layer. The ceramic layer is formed of an oxide and/or an oxynitride of at least one metal of the group of titanium, niobium,

5 tantalum, zirconium, aluminum and silicon. Various methods are provided for production of the stimulation electrode, including methods in which the ceramic layer is formed *in situ* by a thermal, chemical or electrochemical oxidation or oxynitridation process. The stimulation electrode may be used as a cardiac pacemaker electrode, a neuro-stimulation electrode, or another human implant.